

REMARKS

Claims 1, 3, 5, 7, and 10 are pending, of which Claims 1, 3, 5, and 7 are independent.

Summary of Embodiments of Applicants' Invention

An example of one embodiment of Applicants' invention is described below to highlight some aspects of the invention. More on the embodiment described below can be found at least in page 5, lines 8–24; page 9, lines 9–27; and in Figures 2, 3, and 6 of the application as filed. The description below is an example of one of many embodiments that fall within the scope of Applicants' claims and is provided to illustrate some aspects of Applicants' invention, not to limit the claims.

Embodiments include a router configured to connect to another router using a composite trunk formed by aggregating multiple physical links. Applicants' Figures 2 and 3 show an example router 1 connected to router 2 via a composite trunk 10 formed of four trunks 11–14. When router 1 receives a packet for router 2, router 1 switches the packet to one of the line cards 41–44 coupled to the composite trunk 10 using a switching fabric 100 that routes the packet according to values in a fabric forwarding table (e.g., the table shown in FIG. 6). An output port selector (not shown) balances the load across the trunks 11–14 of the composite trunk 10 by distributing the packets across the individual trunks comprising the composite trunk. If a trunk 11 of the composite trunk 10 becomes a bottleneck, the entry or route in the fabric forwarding table corresponding to trunk 11 can be adjusted so that the output port selector directs packets to one of the other output trunks 12–14 to balance the load across the composite trunk 10.

Rejection of Claims 1 and 5 under 35 U.S.C. § 103

Claims 1 and 5 have been rejected as being unpatentable over U.S. Patent Application Publication No. 2004/0037278 A1 (Wong) and U.S. Patent No. 6,262,974 (Chevalier). Specifically, the instant Office Action states that it would have been obvious to modify Wong's packet switch to use Chevalier's load balancing approach.

Wong's FIG. 1 shows a packet switch 10 that switches signals between network ports 14 for transmitting and receiving network packets via network links 15, which can be aggregated into trunked links 17. A packet routing unit 180 in the switch 10 routes incoming packets according to routing information in a packet routing table 134 (FIGS. 3A and 3B) with an

address resolution circuit 136 (FIGS. 3A, 3B, 5, 7, and 8). A load balanced trunked link port mapping system 168 in the switch 10 balances the packets with a load balancing unit 190 using one of three load balancing schemes: 1) a port-based load balancing scheme; 2) a first media access controller (MAC) address table based load balancing scheme; and 3) a second MAC address table based load balancing scheme.

The port-based scheme routes packets with “a port-based static programmed mapping scheme.” (Wong, paragraph 0041; emphasis added.) That is, a given packet is routed based on its input port. In the first MAC address scheme, the address resolution circuit 136 routes each packet based on the MAC address of the packet’s source using the packet routing table 134. In the second MAC address scheme, the address resolution circuit 136 routes each packet based on both the packet’s source and the packet’s destination using the packet routing table 134. Wong does not suggest changing weights or routes to balance the load.

Chevalier discloses a method of splitting predefined reservable link bandwidth into portions that can be assigned on a priority basis. Although Chevalier refers to “load balancing for fairly distributing traffic over all the links of the network to avoid local congestion” (col. 2, lines 37–38), Chevalier does not elaborate on load balancing. Instead, Chevalier merely states that the network computes paths using topology databases storing information that is “regularly updated from network management services” (col. 3, lines 4–5).

In contrast, Claim 1 recites a network router with an output port selector capable of “balancing load across the trunks of the composite trunk according to dynamically adjustable weighting, the load approaching balance across the trunks” (emphasis added). As neither Wong nor Chevalier discloses dynamically adjustable weighting, much less balancing loads with dynamically adjustable weighting, combining Wong and Chevalier does not yield the network router recited in Claim 1. Similarly, combining Wong and Chevalier does not result in the method of Claim 5 because neither Wong nor Chang disclose “selecting one of plural trunks ... with dynamically adjustable weighting,” as recited in Claim 5. Accordingly, Applicants respectfully request withdrawal of the rejection of Claims 1 and 5.

Rejection of Claims 3, 7, and 10 under 35 U.S.C. § 103

Claims 3, 7, and 10 have been rejected as being unpatentable over Wong and U.S. Patent No. 5,095,480 (Fenner) in view of Chevalier. The instant Office Action states that it would have

been obvious to modify Wong's packet switch to use Chevalier's load balancing approach and Fenner's dynamic hashing and memory allocation techniques.

Fenner discloses techniques to "automatically adjust the size of the routing table directory and routing records" (col. 4, lines 61–63; emphasis added). For example, Fenner's FIG. 4 shows blocks 138, 142, and 144 that compress destination or source address from the header 124 of an arriving packet. The compressed values are used to create an index 136 keyed to an address directory 130. Fenner's system changes the amount of memory used to store the address directory 130, not the content of the address directory 130.

Thus, Fenner does not disclose dynamically adjusting table routes. As discussed above, neither Wong nor Chevalier explicitly disclose dynamically adjusting table routes either. Therefore, combining Wong, Fenner, and Chevalier does not yield a system that with "table routes being dynamically adjustable for a load to approach balance across the trunks," as recited in Claims 3 and 7.

Claim 10, which depends from Claim 5, is patentable over Wong, Fenner, and Chevalier because Fenner does not remedy the deficiencies of Wong and Chevalier with respect to Claim 5, as discussed above.

Accordingly, Applicants respectfully request withdrawal of the rejection of Claims 3, 7, and 10.

Information Disclosure Statement

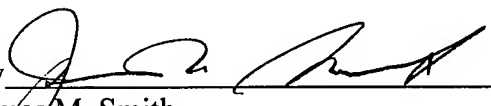
A Supplemental Information Disclosure Statement (IDS) is being filed concurrently herewith. Entry of the Supplemental IDS is respectfully requested.

CONCLUSION

In view of the above remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By 
James M. Smith
Registration No. 28,043
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

Date:

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